Factsheet- Montserrat Eruption and VI Drinking Water 8/1/01

Dates: July 30, 2001

Location: Virgin Islands

Contaminant: Volcanic Ash from Montserrat in VI drinking water

Occurrence: Ash was reported to be falling throughout Virgin Islands around 6 am Monday 7/30/2001 due to a volcanic eruption. It occurred when magma squeezes out from a vent in the volcano, creating a giant lava dome. When the dome becomes too steep, it collapses and disintegrates to form an ash plume that rises and spreads.

Ash characteristic: Grayish powder
Non-organic sulphur-based compound, insoluble and inert
In water, ash should settle to the bottom within a day or so

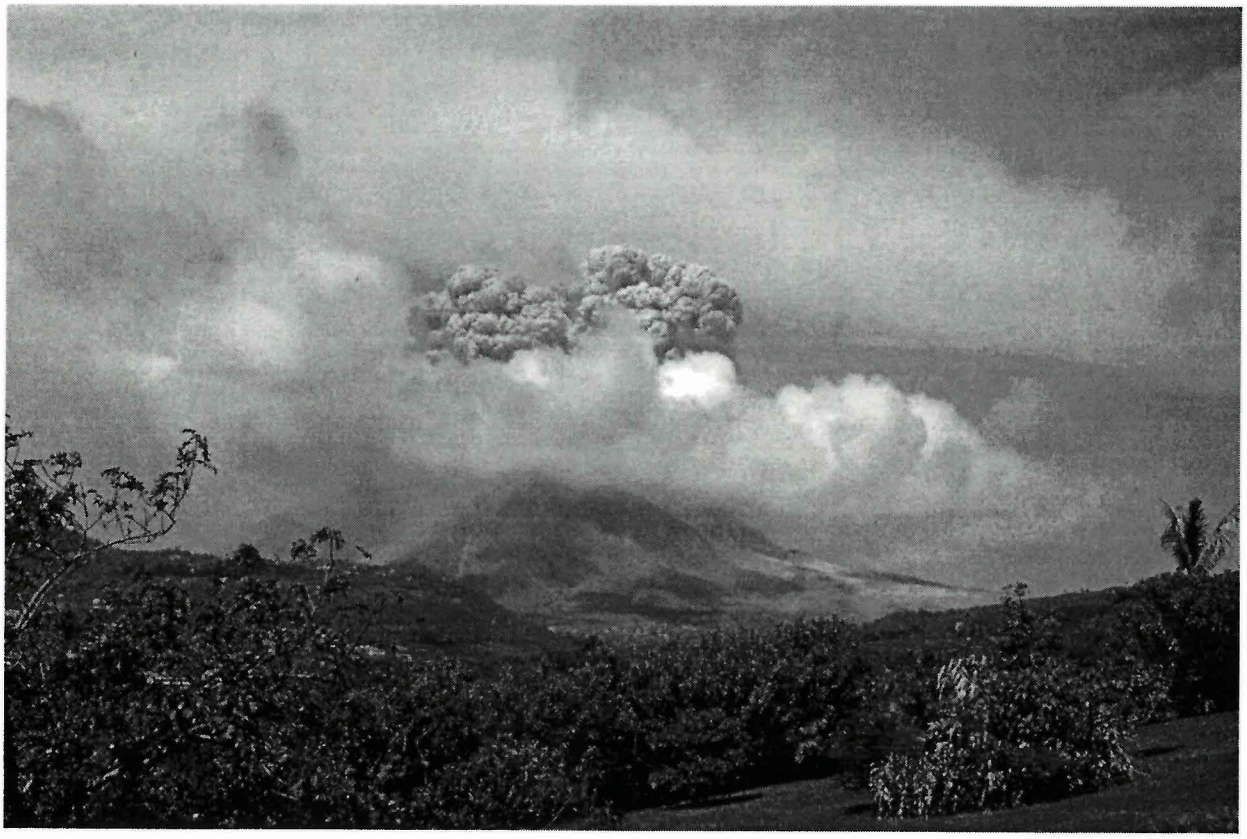
Water System Configuration:
Majority of the VI's community water systems and private residence collect rainwater through roof catchment, and storage in cisterns.

Issues:
- Ash had fallen throughout the Virgin Islands along with the heavy rain on Sunday (7/29/01) night
- Ash had contaminated the cisterns as a result of the use of roof catchment
- Since most of the private residences are not equipped with filtration, there was an immediate health concern

Recommendations:
- DPNR advised residents to disconnect or block roof downspouts leading to cisterns
- DPNR advised residents to decant or filter the ash contaminated water
- DPNR advised those users that have cisterns to boil water for 3 to 5 minutes before using it for drinking or cooking purposes

Expert Sources:
- Caribbean Disaster Emergency Response Agency (CDERA)
- United States Geological Survey (USGS)
- Hawaii- Safe Drinking Water Department
- Anchorage Water & Wastewater Utility (AWWU), Alaska

Below: Picture of 1997 Montserrat Eruption- Soufriere Hills Volcano



664-491-7166

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
290 BROADWAY
NEW YORK, NY 10007-1866

FAX COVER SHEET

To:	Harold Mark	**Date:**	July 30, 2001
Fax #:	340-773-9310	**Pages:**	10 (including this cover sheet)
From:	Robert Poon		
Subject:	Montserrat Ashes		

COMMENTS: I have enclosed the MSDS from the volcano ashes (contains 10 to 25% cristobalite, a form of crystalline silica). Since the melting point is above 3190 F, the cisterns need to be flush completely. rp

VI - personal cistern

- flush ^Also 3-5 years

- Air sample (10 > [illegible] microns) Ash

~~Contact~~ R9

Corinne Li 415-744-1858

~~Mar~~ Barry Pollock

→ 415-744-1854

Hawaii

Bill Wong Safe Drinking Program.

R10

Michael Cox

206-553-1883

Tim Hamlin

206-553-1563

Robert Cutler ✓

360-~~753~~ 753-9543

Stuart Ramado - Chief Engineering.

- Sulfate acid Rain & high concentration of ↓ metals.

- no major cases.

Alaska. (Ash settle when wetted)

Jack (operator) (15-20 years) once every with no Ash.

Member of AWWU
Anchorage Water & ~~E W W Util~~ ~~Health~~ Wastewater Utility

largest in Alaska.

Material Safety Data Sheet
J. R. Simplot Company
AgriBusiness

Trade Name: Silica Sand #55, #60, #70, #90 & Standard **M80002**
Registration No: None

SECTION 1 CHEMICAL PRODUCT AND COMPANY INFORMATION

Manufacturer or Formulator: Simplot Silica Products
P.O. Box 308
Overton, NV 89040
Emergency Phone - Chemtrec: 1-800-424-9300

Product Name: Silica Sand
Common Name: Silica Sand
Chemical Type: Not listed

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name and Synonyms	C.A.S. No.	Chemical Formula	WT%	TLV	PEL (mg/M^3)
			Hazardous		Silica, Crystalline - respirable dust
Silica (crystalline)	14808-60-7	SiO_2	99	0.1 mg/M^3 Respirable Dust	Quartz 0.1 Cristobalite 0.05 Tridymite 0.05 Tripoli 0.1
			Non-Hazardous		
None listed					

SECTION 3 HAZARDS IDENTIFICATION

Ingestion: Not listed
Inhalation: Acute, short term exposure; mild and temporary discomfort to respiratory tract. Similar to nuisance dust. Excessive inhalation of crystalline silica is a serious health concern.
Eye Contact: Abrasive in eyes.
Skin Absorption: Not available.
Skin Contact: Not available.
Effects of Overdose: Chronic, long term exposure (10 years - 30 years), may result in pulmonary fibrosis (silicosis). Aggravates bronchitis, asthma and emphysema.

SECTION 4 FIRST AID MEASURES

Ingestion: First aid procedures not normally required.
Inhalation: Remove exposed person to fresh, clean air.
Eyes: Flush with clean water, avoid rubbing.
Skin: Not listed

SECTION 5 FIRE FIGHTING MEASURES

Extinguishing Media: Not applicable
Special Fire Fighting Procedures: Not applicable
Unusual Fire and Explosion Hazards: None

SECTION 6 ACCIDENTAL RELEASE MEASURES

Environmental Precautions: Not listed
Steps to be taken in case material is released or spilled:
Material may be wetted with water to reduce dust and collected for reprocessing or disposal.

SECTION 7 HANDLING AND STORAGE

Precautions to be taken in handling and storing:
Avoid prolonged breathing of dust.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Protection: Local exhaust as needed.
Respiratory Protection: As required. Approved respirators (paper disposable; 1/2 or full face piece air purifying,supplied air).
Protective Clothing: Normal work clothes.
Eye Protection: Safety glasses with side shields as required.
Other: None

Trade Name: Silica Sand #55, #60, #70, #90 & Standard **M80002**
Registration No: None

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point:	2230°C	**Solubility in Water:**	None
Density:	110 lbs/ft^3	**% Volatiles (by volume):**	Not listed
Flashpoint:	Not applicable	**Vapor Pressure, mm Hg:**	Not applicable
pH:	Not listed	**Reaction with Water:**	None
Appearance:	Very hard, fine grained particles; white, buff or pink in color; odorless.		
Extinguishing Media:	Not applicable. Non-flammable.		

SECTION 10 STABILITY AND REACTIVITY

Stability (Normal Conditions): Stable
Conditions to Avoid: None listed.
Incompatibility (Material to Avoid): ClF_3, MNF_3, OF_2.
Hazardous Decomposition Products: None
Hazardous Polymerization: Will not occur
Conditions to Avoid: Not applicable

SECTION 11 TOXICOLOGY INFORMATION

None listed.

SECTION 12 ECOLOGICAL INFORMATION

None listed.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste Disposal Procedures: May be land filled according to local, state and federal regulations.

SECTION 14 TRANSPORT INFORMATION-

Shipping name:	Not regulated by D.O.T.		
Hazard Class:	Not listed	**C.A.S. Number:**	14808-60-7
Reportable Quantity (RQ):	Not listed	**D.O.T. Number:**	Not listed
Labels Required:	Not listed	**Haz Waste No:**	Not listed
Placard:	Not listed	**EPA Regist No:**	Not listed

SECTION 15 REGULATORY INFORMATION

Carcinogenicity:
by IARC?: Yes (X) No ( ) by NTP?: Yes (X) No ( )
IARC classifies crystalline silica in Group 2A, "probably carcinogenic to humans."
NTP classifies respirable crystalline silica in a category of substances which may "reasonably be anticipated to be carcinogens."

California Prop 65: Yes (X) No ( )
Silica, crystalline (airborne particles of respirable size), is cited in 90 California Reg. Notice 984, Safe Drinking Water and Enforcement Act of 1986, as known to the state of California to cause cancer.

Not on the 302 list of SARA reportable quantities.

SECTION 16 OTHER INFORMATION

Flash Point (Test Method):	Non-flammable	**Flammable Limits**	**LOWER**	**UPPER**
Autoignition Temperature:	Not applicable	(% BY VOLUME)	N/A	N/A

Hazard Rating (N.F.P.A.): **Health:** 1 **Fire:** 0 **Reactivity:** 0 **Specific:** Not applicable
This N.F.P.A. rating is a recommendation by the manufacturer using the guidelines or published evaluations prepared by the National Fire Protection Association (N.F.P.A.).

MSDS Version Number: 3 (revisions to Section 15)

Reviewed by: The Department of Regulatory Affairs
July 1999 (208) 238-2700

Thermal Ceramics

MATERIAL SAFETY DATA SHEET

MSDS No:	151-2	Date Prepared:	03/28/1995	Revised/Reviewed:	02/23/2001

1. PRODUCT AND COMPANY IDENTIFICATION

Product: Refractory Castable, Refractory Concrete

Intended Use: High Temperature Thermal Insulation

Trade Names: **K-25HS, K-25XHS, K-26S, K-26ES, K-26HS, K-26LI, K-28, K-28S, K-30, K-30S, K-3000, K-3000S; Firebrick: 80, 80D, 80DZ; TC 140; JM-26; JM-28; JM-30; IFB Dust**

Manufacturer/Supplier:

THERMAL CERAMICS INC.
P.O. BOX 923; DEPT. 300
AUGUSTA, GA 30903-0923

Product Stewardship Program: 800-722-5681 / FAX: 706-560-4053
For additional MSDS's, call our automated FAXBACK: 800-329-7444

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT & CAS NUMBER	% BY WEIGHT	OSHA PEL	ACGIH TLV
Crystalline silica - quartz[1] 14808-60-7	up to 0.3	0.1 mg/m^3 (respirable dust)	0.1 mg/m^3 (respirable dust)
Crystalline silica - cristobalite[1] 14464-46-1	0.5 - 21	0.05 mg/m^3 (respirable dust)	0.05 mg/m^3 (respirable dust)
Zirconium oxide 7440-67-7	0 - 5	15 mg/m^3 (total dust); 5 mg/m^3 (respirable dust)	5 mg/m^3; 10 mg/m^3 (STEL)
Ferric oxide 1309-37-1	0.3 - 1.5	10 mg/m^3	5 mg/m^3
Titanium dioxide 13463-67-7	1.0 - 2.0	15 mg/m^3	10 mg/m^3
Calcium oxide 1305-78-8	0 - 1	5 mg/m^3	2 mg/m^3
Aluminum oxide 1344-28-1	40 - 70	15 mg/m^3 (total dust); 5 mg/m^3 (respirable dust)	10 mg/m^3
Silica, amorphous 7631-86-9	35 - 60	(80 mg/m^3 ÷ % SiO_2) or 20 mppcf	10 mg/m^3

NOTES:

(1) Depending on the percentage and type(s) of silica in the mineral, the OSHA Permissible Exposure Limit (PEL) for respirable dust containing crystalline silica (8 HR TWA) is based on the formula listed in 29 CFR 1910.1000, "Air Contaminants" under Table Z-3, "Mineral Dust". For quartz containing mineral dust, the PEL = 10 mg/m^3 / (% of silica + 2); for cristobalite or tridymite, the PEL = 5 mg/m^3/ (% of silica + 2); For mixtures, the PEL = 10 mg/m^3 / (% of quartz + 2 (% of cristobalite) + 2 (% of tridymite) + 2).

(See Section 8 for Personal Protection Guidelines.)

MATERIAL SAFETY DATA SHEET

MSDS No: 151-2	Date Prepared: 03/28/1995	Revised/Reviewed: 02/23/2001

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

**** WARNING ****

Potential cancer hazard by inhalation due to the presence of crystalline silica. (See Section 11 for more information)

Possible Health Effects

Target Organs:	Eyes, skin, nose and/or throat
Primary Entry Route:	Inhalation
Acute effects:	May cause temporary, mild mechanical irritation to the eyes, skin, nose and/or throat. Pre-existing skin and respiratory conditions may be aggravated by exposure.
Chronic effects:	Prolonged/repeated inhalation of respirable crystalline silica may cause delayed lung injury (silicosis).

Hazard Classification:

The Ninth Annual Report on Carcinogens (2000), prepared by the **National Toxicology Program (NTP),** classified silica, crystalline (respirable size), as a substance known to be a human carcinogen.

The **International Agency for Research on Cancer (IARC)** has classified crystalline silica inhaled in the form of quartz or cristobalite from occupational sources as carcinogenic to humans (Group 1).

The **State of California,** pursuant to Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986, has listed "silica, crystalline (airborne particles of respirable size)" as a chemical known to the State of California to cause cancer.

Signs and Symptoms of Overexposure:

Eye Contact:	Mechanical irritation, laceration.
Skin Contact:	Mechanical irritation.
Ingestion:	Unlikely route of exposure.
Inhalation:	Irritation or soreness in nose, throat and/or upper respiratory tract.

4. FIRST AID MEASURES

Eye Contact:	Flush with large amounts of water for at least 15 minutes. Do not rub eyes.
Skin Contact:	Wash affected area gently with soap and water. Skin cream or lotion after washing may be helpful.
Ingestion:	Unlikely route of exposure.
Inhalation:	Remove affected person to clean fresh air.

**** If any of the symptoms persist, seek medical attention.**

5. FIRE FIGHTING MEASURES

NFPA Codes:	Flammability: 0 , Health: 1 , Reactivity: 0 , Special: 0
NFPA Unusual Hazards:	None
Flash Point:	Non-combustible
Extinguishing Media:	Use extinguishing media appropriate to the surrounding fire.
Explosion Hazards:	None

MATERIAL SAFETY DATA SHEET

MSDS No: 151-2	Date Prepared: 03/28/1995	Revised/Reviewed: 02/23/2001

6. ACCIDENTAL RELEASE MEASURES

Spill/Leak Procedures: Avoid creating airborne dust. Follow routine housekeeping procedures. Vacuum only with HEPA filtered equipment. If sweeping is necessary, use a dust suppressant and place material in closed containers. Do not use compressed air for clean-up. Personnel should wear gloves, goggles and approved respirator. Avoid clean-up procedures that could result in water pollution.

7. HANDLING AND STORAGE

Handling: Limit use of power tools unless in conjunction with local exhaust. Use hand tools whenever possible. Frequently clean the work area with HEPA filtered vacuum or wet sweeping to minimize the accumulation of debris. Do not use compressed air for clean-up.

Storage: This product is stable under all conditions of storage. Store in original factory container in a dry area. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use engineering controls such as ventilation and dust collection devices to reduce airborne particulate concentrations to the lowest attainable level.

Respiratory Protection: When it is not possible or feasible to reduce airborne crystalline silica or particulate levels below the PEL through engineering controls, or until they are installed, employees are encouraged to use good work practices together with respiratory protection. Before providing respirators to employees (especially negative pressure type), employers should **1)** monitor for airborne crystalline silica and/or dust concentrations using appropriate NIOSH analytical methods and select the respiratory protection based upon the results of that monitoring , **2)** have the workers evaluated by a physician to determine the workers' ability to wear respirators, and **3)** implement respiratory protection training programs. Use NIOSH certified particulate respirators (42 CFR 84), in compliance with OSHA Respiratory Protection Standard 29 CFR 1910.134 and 29 CFR 1926.103, for the particular hazard or airborne concentrations to be encountered in the work environment. For the most current information on respirator selection, contact your supplier.

Protective Clothing: Wear full body clothing, gloves, hat and eye protection. Wash work clothes separately from other clothing. Rinse washer after use. If you take work clothing home, it is recommended you vacuum your clothes with a HEPA filtered vacuum before leaving the work area.

Eye Protection: Goggles/safety glasses with sideshields should be worn.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Solid brick or block		
Chemical Family:	Aluminosilicates		
Vapor Pressure:	Not applicable	Vapor Density:	Not applicable
Boiling Point:	Not applicable	Specific Gravity Range:	0.77 – 2.4
Melting Point:	3190°F to 3350°F	Volatile by Volume (%):	Not applicable
Water Solubility (%):	Not soluble in water	pH:	Not applicable

10. STABILITY AND REACTIVITY

Hazardous Polymerization:	Will not occur
Chemical Incompatibilities:	Powerful oxidizers; fluorine, manganese trioxide, oxygen disulfide
Hazardous Decomposition Products:	None

MATERIAL SAFETY DATA SHEET

MSDS No: 151-2	Date Prepared: 03/28/1995	Revised/Reviewed: 02/23/2001

11. TOXICOLOGICAL INFORMATION

Toxicology:

- Crystalline silica

There is sufficient evidence of carcinogenicity of respirable silica in experimental animals (IARC Monograph; Vol. 42; 1987 and IARC Monograph; Vol. 68; 1997). Inhalation and intratracheal installation of crystalline silica in rats caused lung cancer; however, studies in other species such as mice and hamsters caused no lung cancer. Crystalline silica also caused fibrosis in rats and hamsters in several inhalation and intratracheal installation studies.

Epidemiology:

- Crystalline silica

Results of several epidemiology studies have indicated that diseases which may be caused by the uncontrolled inhalation of crystalline silica include silicosis, pulmonary tuberculosis or industrial bronchitis. In evaluating crystalline silica as a cancer risk, the International Agency for Research on Cancer (IARC) reviewed several studies from different industries and concluded that crystalline silica from occupational sources inhaled in the form of quartz or cristobalite is carcinogenic to humans (Group 1) [IARC Monograph; Vol. 68; June 1997]. However, in reaching its conclusion, IARC stated that the carcinogenicity in humans could not be found in all industries reviewed and that carcinogenicity might be dependent on inherent characteristics of crystalline silica or on external factors affecting biological activity (e.g., cigarette smoking) or distribution of its polymorphs.

12. ECOLOGICAL INFORMATION

Adverse effects of this material on the environment are not anticipated.

13. DISPOSAL INFORMATION

Waste Management: To prevent waste materials becoming airborne, a covered container or plastic bagging is recommended. Comply with federal, state and local regulations. Method of disposal: Landfill. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate, or otherwise inappropriate.

RCRA: If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal whether a material containing the product or derived from the product should be classified as a hazardous waste (40 CFR 261.20-24).

14. TRANSPORT INFORMATION

Department of Transportation (D.O.T.):

Hazard Class:	Not regulated	United Nations (UN) Number:	Not applicable
Labels:	Not applicable	North America (NA) Number:	Not applicable
Placards:	Not applicable		
Bill of Lading:	Product name		

15. REGULATORY INFORMATION

United States Regulations

SARA Title III: This product does not contain any substances reportable under Sections 302, 304, 313 (40 CFR 372). Sections 311 and 312 apply.

OSHA: Comply with Hazard Communication Standards 29 CFR 1910.1200 and 29 CFR 1926.59 and Respiratory Protection Standards 29 CFR 1910.134 and 29 CFR 1926.103.

MATERIAL SAFETY DATA SHEET

MSDS No: 151-2	Date Prepared: 03/28/1995	Revised/Reviewed: 02/23/2001

TSCA:	All substances contained in this product are listed in the TSCA Chemical Inventory [Section 8(b)].
California:	"Silica, crystalline (airborne particles of respirable size)" is listed in Proposition 65, The Safe Drinking Water and Toxic Enforcement Act of 1986 as a chemical known to the State of California to cause cancer.
Other States:	Crystalline silica products are not known to be regulated by states other than California; however, state and local OSHA and EPA regulations may apply to these products. Contact your local agency if in doubt.
International Regulations	
Canadian WHMIS:	Class D-2A Materials Causing Other Toxic Effects
Canadian EPA:	All substances in this product are listed, as required, on the Domestic Substance List (DSL).

16. OTHER INFORMATION

HMIS Hazard Rating:

HMIS Acute Health: 1*
HMIS Flammable: 0
HMIS Reactivity: 0
HMIS Personal Protective: To be supplied by user depending upon use
*See Section 3 of the MSDS for possible chronic health effects.

SARA Title III Hazard Categories:

Acute Health:	No	**Pressure Hazard:**	No
Chronic Health:	Yes	**Reactivity Hazard:**	No
Fire Hazard:	No		

Definitions:

ACGIH:	American Conference of Governmental Industrial Hygienists
ADR:	Carriage of Dangerous Goods by Road (International Regulation)
CAA:	Clean Air Act
CAS:	Chemical Abstracts Service Registry Number
CERCLA:	Comprehensive Environmental Response, Compensation and Liability Act
EPA:	Environmental Protection Agency
EU:	European Union
f/cc:	Fibers per cubic centimeter
HEPA:	High Efficiency Particulate Air
HMIS:	Hazardous Materials Identification System
IARC:	International Agency for Research on Cancer
IATA:	International Air Transport Association
IMDG:	International Maritime Dangerous Goods Code
mg/m^3 :	Milligrams per cubic meter of air
mppcf:	Million particles per cubic meter
MSHA:	Mine Safety and Health Administration
NFPA:	National Fire Protection Association
NIOSH:	National Institute for Occupational Safety and Health
OSHA:	Occupational Safety and Health Administration
PEL:	Permissible Exposure Limit

MATERIAL SAFETY DATA SHEET

MSDS No:	151-2	Date Prepared:	03/28/1995	Revised/Reviewed:	02/23/2001

PNOC:	Particulates Not Otherwise Classified
PNOR:	Particulates Not Otherwise Regulated
RCRA:	Resource Conservation and Recovery Act
RID:	Carriage of Dangerous Goods by Rail (International Regulation)
SARA:	Superfund Amendments and Reauthorization Act
Title III:	Emergency Planning and Community Right to Know Act
...Section 302:	Extremely Hazardous Substances
...Section 304:	Emergency Release
...Section 311:	MSDS/List of Chemicals
...Section 312:	Emergency and Hazardous Inventory
...Section 313:	Toxic Chemicals Release Reporting
STEL:	Short-Term Exposure Limit
TCLP:	Toxicity Characteristics Leaching Procedures (EPA)
TLV:	Threshold Limit Values (ACGIH)
TSCA:	Toxic Substance Control Act
WHMIS:	Workplace Hazardous Materials Information System (Canada)

29 CFR 1910.134 & 1926.103: OSHA Respiratory Protection Standards
29 CFR 1910.1200 & 1926.59: OSHA Hazard Communication Standards

Revisions: Replaces revision 01/31/2001. MSDS revised with updated information and the trade name TC-1400 changed to TC 140 (see Section 1).

MATERIAL SAFETY DATA SHEET

MSDS No:	151-2	Date Prepared:	03/28/1995	Revised/Reviewed:	02/23/2001

PRODUCT SAFETY INFORMATION

CRYSTALLINE SILICA CONTAINING PRODUCT
(Quartz CAS #14808-60-7 And/Or Cristobalite CAS #14464-46-1)

WARNING:

- This product contains crystalline silica, which has been identified by the International Agency for Research on Cancer (IARC) as a known carcinogen to humans.

Avoid breathing particulates and dust

RISKS:

- Possible cancer hazard by inhalation.
- May cause silicosis (lung disease) by inhalation.
- May cause temporary mechanical irritation to eyes, skin, nose and/or throat.

PRECAUTIONARY MEASURES:

- Minimize airborne particulates and dust with engineering controls.
- Wear a NIOSH certified respirator.
- Wear long sleeved, loose-fitting clothing, eye protection, and gloves.
- Wash work clothing separately and rinse washing machine after use.

FIRST AID MEASURES:

Eyes:	Flush with water.
Skin:	Wash with soap and warm water.
Ingestion:	Unlikely route of exposure.
Inhalation:	Remove to fresh clean air.

If any of the above irritations persist, seek medical attention.

FOR ADDITIONAL PRODUCT INFORMATION AND WORK PRACTICES, REFER TO THE MATERIAL SAFETY DATA SHEET (MSDS).

THERMAL CERAMICS INC.
P.O. BOX 923 DEPT. 300
AUGUSTA, GA 30903-0923
(800) 722-5681

Canadian WHMIS Class D-2A: Material causing other toxic effects.

Label No: 2-0895 (Rev. 12/2000)

ASHFALL' ISN'T TOXIC BUT CAN CAUSE PROBLEMS
by Jean Etsinger and Molly Morris
2001-07-30 21:23:13

July 30, 2001 - Scientists call it "ashfall" -- like rainfall, or, in less temperate climes, snowfall. It started silently settling on the Virgin Islands and eastern Puerto Rico Sunday night, catching everyone by surprise when the sun came up.

The fresh volcanic ash that residents found coating their immediate worlds Monday is unsightly, abrasive and a hassle to clean up, but it's not toxic. However, breathing it in may cause trouble for young children, the elderly and anyone with chronic respiratory ailments.

That's the expert information to be found in a web site section titled "What to do in case of an ashfall." It's information from the U.S. Geological Survey and the state of Washington's Emergency Management Division that can be found at What to do during ashfall.

What initially was misdiagnosed as "Sahara dust" is, in fact, the airborne matter from a "volcanic event that occurred on the island of Montserrat," as a release from the Planning and Natural Resources Department Monday put it. The National Oceanographic and Atmospheric Administration issued advisories throughout the day Monday on the fallout from the Soufriere Hills volcano.

Reports noted that "the thin, diffuse plume emanating from the volcano was being obscured by high-level clouds to the west of Montserrat," making it impossible to capture any satellite imagery. However, it said, "Activity at the volcano remains low, similar to what has been observed over the last several weeks."

The V.I. Health Department issued a release Monday advising persons with respiratory ailments to limit outdoor activities and seek to avoid inhaling airborne ash.

"The volcanic ash is described as a non-organic sulphur-based compound, which does not pose an immediate health hazard," the release stated. It noted that those with respiratory conditions may experience eye irritation, nasal congestion, tightness in the chest and difficulty breathing. If these symptoms persist, it said, medical attention should be sought.

Further, it said, if the ash has gotten into cisterns, "it should settle to the bottom within a day or so."

The advisory recommended that users of cistern water boil it for 3 to 5 minutes before using it for drinking or cooking purposes.

The release from Planning and Natural Resources, issued earlier in the day, advised residents to disconnect or block roof downspouts leading to cisterns, a recommendation in times of hurricane as well, due to the threat of salt water contamination. It recommended hosing down roofs before reconnecting the spouts.

However, Lesley Leonard, acting supervisor of the DPNR Air Pollution Control Program, questioned whether boiling water would have any effect, since the ash is not a bacterial substance. Also, she noted, the ash is not water-soluble. What is being disseminated through the air is gases and particulate matter. She said filtering should eliminate any ash-related danger from otherwise safe drinking water.

As far as cleaning up, the DPNR release said the ash can be removed from surfaces with water but recommended wearing a face mask while trying to remove it in dry form.

The Geological Survey web site also notes if volcanic ash gets into the inner workings of mechanical devices, from computers to cars, it can jam things up. It can contaminate and clog ventilation systems, water supplies and drains. And it can cause short circuits -- "Power often goes off during and after ashfall," it states.

Personal experiences

Cars all over the islands looked like misplaced mini-dinosaurs, covered in the gray, gritty ash. Farmers and car-wash operators were happy, but just about everyone else was perplexed by what to do about it. Many contact-lens wearers were in pain. Carlos Robles, horticultural specialist at the University of the Virgin Islands Cooperative Extension Service, said both Sunday's downpour and Monday's ashfall bode well for the territory's farming community. If there is a high concentration of potassium in the ash, it could be incorporated right back into the soil, and "farmers are likely to see a difference in plant growth" for the better, he said. He hadn't been able to get the ash analyzed Monday.

St. Thomas resident Jimmy Magras, noting that his trees and plants were covered in ash, said he had heard about the potentially beneficial effects of the potassium and added, "I hope it's good, and not not good." On St. Croix, North Shore resident Lisa Giorgi said she listened to discussion of the ash situation on a St. Thomas radio station Monday morning and only then went outside, shortly before noon, to see if her island had been affected. "I discovered my car was covered with it, and the leaves on all the bushes," she said. And then she realized that inside her home, "the furniture was covered, too." The matter entered the house through louvered windows and a screened gallery. There would simply have been no way to keep it out.

Giorgi's eyeball analysis of the ash was that "it sort of sticks. Indoors, it looks as if it's dusty, but you can't just brush it off; there's a residue that clings to the furniture. It's a terrible mess."
On St. Thomas, Jane and Jerry Immel went out on their tugboat, Lady Salvor, around 2 a.m. Monday to take out a container ship, and all appeared normal. At 4 a.m., they went out again to bring another vessel into the harbor -- and found their boat covered in gray matter.

"We didn't know what to make of it in the dark," Jane Immel said. By the time they got back to Crown Bay in the dawn's early light, they had figured out the cause. "I hope I'm finished sweeping now," she said. According to meteorologists, the odds are against it.

Further ash may fall

While the air was clear over the Virgin Islands late Monday afternoon, skies remained overcast. It was Sunday's tropical wave that carried the ash northwestward from Montserrat to the territory and Puerto Rico Sunday. Another tropical wave moving across the Atlantic is expected to bring weather similar rains and heavy winds to the territory by Wednesday, the National Weather Service reported. It could well carry -- and drop -- another layer of volcanic dust.

The Soufriere Hills volcano on the island of Montserrat, about 275 miles south of the Virgin Islands, has been active since 1995. The current activity apparently is implosive, as opposed to explosive, and does not pose any immediate threat to those still living on the island.

For continuous updates on the volcanic ash emanating from Montserrat, see the Washington Volcanic Ash Advisories page of the National Oceanographic and Atmospheric Administration's Satellite Services Division web site http://www.ssd.noaa.gov/VAAC/messages.html.

Walter Andrews
07/30/01 05:24 PM

To: George Pavlou/R2/USEPA/US@EPA
cc: Ron Borsellino/R2/USEPA/US@EPA, Kathy Callahan/R2/USEPA/US@EPA, Bruce Kiselica/R2/USEPA/US@EPA, Michael Lowy/R2/USEPA/US@EPA, Robert Poon/R2/USEPA/US@EPA, Douglas McKenna/R2/USEPA/US@EPA, Paul Molinari/R2/USEPA/US@EPA, Victor Trinidad/R2/USEPA/US@EPA
Subject: Volcanic ash in USVI cisterns

Robert Poon is preparing a fact sheet regarding the Montserrat volcanic ash contamination of cistern water supplies in the USVI. It will address:

-Unique conditions that caused the contamination

-Expert sources contacted for health information

-Basic characterization of the Montserrat ash as nontoxic

-Advice to VI officials regarding use of cistern water for drinking and other uses in the short term.

tx

Walter Andrews, Chief
Water Programs Branch
USEPA Region 2, RM 2432
290 Broadway
New York, NY 10007-1866
Phone: 212-637-3880
FAX: 212 637-3887
E-Mail: Andrews.Walter@epamail.epa.gov

Gerard McKenna
07/31/01 09:04 AM

To: Robert Poon/R2/USEPA/US@EPA, Michael Lowy/R2/USEPA/US@EPA
cc: Angel Salgado/R2/USEPA/US@EPA, Bruce Lin/R2/USEPA/US@EPA, Bruce Kiselica/R2/USEPA/US@EPA
Subject: Re: Montserrat Eruption

Angel Salgado from CEPD will follow up with PRDOH. See below. Does anyone know if the volcano ash would be a problem if it lands in open tanks and/or clear wells? Does it dissolve in water and would it get past treatment? My guess would be not a problem?

Jerry

----- Forwarded by Gerard McKenna/R2/USEPA/US on 07/31/01 08:56 AM -----

Angel Salgado
07/30/01 06:21 PM

To: Gerard McKenna/R2/USEPA/US@EPA
cc: Victor Trinidad/R2/USEPA/US@EPA
Subject: Re: Montserrat Eruption

Roof-catchment is very uncommon here in PR. That is not an issue here as opposed to VI. Most house cisterns in PR are of the closed type, and are generally connected to PRASA (or perhaps to a non-PRASA). However, PRASA's open tanks and clearwells might be more of a concern. Anyway, we will try to get in touch with Olga tomorrow on this issue.

Angel E. Salgado-Torrellas
Environmental Management Branch
Caribbean Environmental Protection Division, USEPA
Gerard McKenna

Gerard McKenna
07/30/01 18:00

To: Angel Salgado/R2/USEPA/US@EPA
cc:
Subject: Re: Montserrat Eruption

In case you did not see this - Robert Poon did some follow up on cisterns in VI (see below).

Jerry

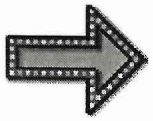
----- Forwarded by Gerard McKenna/R2/USEPA/US on 07/30/01 05:59 PM -----

Gerard McKenna
07/30/01 03:14 PM

To: Victor Trinidad@EPA
cc:
Subject: Re: Montserrat Eruption

FYI

----- Forwarded by Gerard McKenna/R2/USEPA/US on 07/30/01 03:13 PM -----



Michael Lowy
07/30/01 03:10 PM

To: Gerard McKenna/R2/USEPA/US@EPA
cc: Bob Kelly/R2/USEPA/US@EPA, Bruce Kiselica/R2/USEPA/US@EPA, Bruce Lin/R2/USEPA/US@EPA, Douglas McKenna/R2/USEPA/US@EPA, Gerard McKenna/R2/USEPA/US@EPA, Leonard Torrey/R2/USEPA/US@EPA, Mark Rasso/R2/USEPA/US@EPA, Robert Poon/R2/USEPA/US@EPA, Ron

Borsellino/R2/USEPA/US@EPA, Stephanie Sessoms/R2/USEPA/US@EPA, Taj Khan/R2/USEPA/US@EPA, Walter Andrews/R2/USEPA/US@EPA
Subject: Re: Montserrat Eruption

FYI:

I was talking to Olga this AM regarding Sergio Cuevas, but I think they must have shut down somewhere around lunch time because I have not been able to get through since.

Michael Lowy
Environmental Scientist
Drinking Water Section - Water Programs Branch
Region 2 - U.S. EPA
Phone: (212) 637-3830
FAX: (212) 637-3887

Gerard McKenna

Gerard McKenna
07/30/01 03:08 PM

To: Walter Andrews/R2/USEPA/US@EPA
cc: Bob Kelly/R2/USEPA/US@EPA, Taj Khan/R2/USEPA/US@EPA, Bruce Kiselica/R2/USEPA/US@EPA, Bruce Lin/R2/USEPA/US@EPA, Michael Lowy/R2/USEPA/US@EPA, Gerard McKenna/R2/USEPA/US@EPA, Robert Poon/R2/USEPA/US@EPA, Mark Rasso/R2/USEPA/US@EPA, Leonard Torrey/R2/USEPA/US@EPA, Douglas McKenna/R2/USEPA/US@EPA, Ron Borsellino/R2/USEPA/US@EPA, Stephanie Sessoms/R2/USEPA/US@EPA, Robert Poon/R2/USEPA/US@EPA
Subject: Re: Montserrat Eruption

Walt,

I spoke with Victor Trinidad on this - see if PRDOH is doing anything. Victor is pretty sure PRDOH's office is closed today - the air conditioning is not working. I told Victor I would attempt to get in tough with Olga Rivera tomorrow. Cisterns in Puerto Rico may be of concern.

Jerry

Robert Poon

Robert Poon
07/30/01 02:31 PM

To: Walter Andrews/R2/USEPA/US@EPA
cc: DEPP-WPB-DWS, Douglas McKenna/R2/USEPA/US@EPA, Stephanie Sessoms/R2/USEPA/US@EPA, Ron Borsellino/R2/USEPA/US@EPA, Bob Kelly/R2/USEPA/US@EPA
Subject: Re: Montserrat Eruption

Walt,

I received information from VIDPNR about the volcano ash as a result of the tropical wave from Montserrat eruption. VIDPNR had received many calls from other government offices as well. The ash had penetrated into the cisterns by roof-catchment in some of the residence (most in the Southeast of the islands).
Since volcano ash from Montserrat has 10 to 25% cristobalite, a form of crystalline silica, I am faxing two Material Safety Data Sheet (MSDS) to VIDPNR. By the way, we don't regulate cristobalite under the SDWA. However, since those ashes don't dissolve in water until 3190 F, water systems just need to flush the dark gray ashes. If you are interested in the MSDS, let me know.

Robert Poon
Drinking Water Section
(212) 637-3821
Walter Andrews

Walter Andrews
07/30/01 02:07 PM

To: Walter Andrews/R2/USEPA/US@EPA, Denis Durack/R2/USEPA/US@EPA, Robert Gill/R2/USEPA/US@EPA, Jane Leu/R2/USEPA/US@EPA, Linda Longo/R2/USEPA/US@EPA, Katie Lynch/R2/USEPA/US@EPA, Sheri Powell/R2/USEPA/US@EPA, Gladys Pearson/R2/USEPA/US@EPA, Donna Somboonlakana/R2/USEPA/US@EPA, ASGuppy@aol.com, Jeffrey Potent/R2/USEPA/US@EPA, John Cantilli/R2/USEPA/US@EPA, Naomi Cruz/R2/USEPA/US@EPA, Kathleen Drake/R2/USEPA/US@EPA, Daniel Montella/R2/USEPA/US@EPA, Robert Montgomerie/R2/USEPA/US@EPA, Mario Paula/R2/USEPA/US@EPA, David Pohle/R2/USEPA/US@EPA, Mary Thiesing/R2/USEPA/US@EPA, Erika Petrovich/R2/USEPA/US@EPA, Sophia Botello/R2/USEPA/US@EPA, John Chang-Chen/R2/USEPA/US@EPA, Andrea Coats/R2/USEPA/US@EPA, Karen OBrien/R2/USEPA/US@EPA, James Olander/R2/USEPA/US@EPA, Jacqueline Rios/R2/USEPA/US@EPA, Annette Roccanova/R2/USEPA/US@EPA, Edward Schlueter/R2/USEPA/US@EPA, Philip Sweeney/R2/USEPA/US@EPA, Elizabeth VanRabenswaay/R2/USEPA/US@EPA, Delores Gordon/R2/USEPA/US@EPA, Lorrain Deloach-Silver/R2/USEPA/US@EPA, Lynne Facio/R2/USEPA/US@EPA, Michael Hajducek/R2/USEPA/US@EPA, Muhammad Hatim/R2/USEPA/US@EPA, Ray Kvalheim/R2/USEPA/US@EPA, John Mello/R2/USEPA/US@EPA, Donald Palmer/R2/USEPA/US@EPA, Stephen Vida/R2/USEPA/US@EPA, Jill Boone/R2/USEPA/US@EPA, Taj Khan/R2/USEPA/US@EPA, Bruce Kiselica/R2/USEPA/US@EPA, Bruce Lin/R2/USEPA/US@EPA, Michael Lowy/R2/USEPA/US@EPA, Gerard McKenna/R2/USEPA/US@EPA, Robert Poon/R2/USEPA/US@EPA, Mark Rasso/R2/USEPA/US@EPA, Leonard Torrey/R2/USEPA/US@EPA
cc:
Subject: Re: Montserrat Eruption

Se attached FYI.

NOCA42 TJSJ 301401
PNSSJU
PUBLIC INFORMATION STATEMENT
NATIONAL WEATHER SERVICE SAN JUAN PR
1000 AM AST MON JUL 30 2001

...VOLCANIC ASH WILL CONTINUE ACROSS THE U.S. VIRGIN ISLANDS AND PUERTO RICO...

THE MONTSERRAT VOLCANO HAD AN ERUPTION LATE SUNDAY AFTERNOON AND A LARGE AMOUNT OF ASH WAS RELEASED INTO THE ATMOSPHERE. THIS ASH WAS TRANSPORTED NORTHWEST DURING THE NIGHT BY THE STRONG SOUTHEAST WINDS ASSOCIATED WITH THE TROPICAL WAVE.

THE PREVAILING STRONG SOUTHEAST WINDS BEHIND THE TROPICAL WAVE WILL CONTINUE TO TRANSPORT ANY ASH IN THE LOWER LEVELS TOWARDS THE WEST NORTHWEST AT 25 TO 30 MPH THROUGH TODAY. THE ASH IS MOST PREVALENT ABOVE 5000 FEET...BUT ANY SHOWERS WILL BRING THE ASH DOWN TO THE GROUND.

DO NOT CONFUSE THE ASH WITH THE SAHARAN DUST THAT NORMALLY ACCOMPANIES TROPICAL WAVES ON THEIR TREK FROM WEST AFRICA TO THE ANTILLES. AT PRESENT THERE IS ALSO A DEEP LAYER OF HAZE COVERING THE LOCAL AREA.

MOJICA

FPCA72 TJSJ 310912
NOWSJU
SHORT TERM FORECAST
NATIONAL WEATHER SERVICE SAN JUAN PR
504 AM AST TUE JUL 31 2001

PRZ001-002-004>006-311100-
SAN JUAN AND VICINITY-NORTHEAST-EASTERN INTERIOR-NORTH CENTRAL-
CENTRAL INTERIOR-
504 AM AST TUE JUL 31 2001

.NOW...
THROUGH 700 AM...SCATTERED SHOWERS WILL CONTINUE TO DEVELOP OVER THE NORTHEAST SECTIONS OF PUERTO RICO. THE HEAVIEST RAIN WILL BE LOCATED OVER HUMACAO...AND FROM RIO GRANDE WEST TO TOA BAJA... INCLUDING THE SAN JUAN METROPOLITAN AREA. RAIN AMOUNTS WILL GENERALLY BE ONE HALF TO ONE INCH. HOWEVER...SOME ISOLATED AREAS COULD RECEIVE BETWEEN ONE TO TWO INCHES...PRODUCING SOME MINOR FLOODING OF LOW-LYING AND POOR DRAINAGE AREAS AND PONDING OF WATER ON ROADS.

$$

Werner/R2/USEPA/US@EPA, Ron
Borsellino/R2/USEPA/US@EPA, Walter
Andrews/R2/USEPA/US@EPA, Steven Riva/R2/USEPA/US@EPA
Subject: Re: Montserrat Eruption

George,

Here is what we know:
National Weather Service reporting sites have been reporting ash fall since about 6am this morning at San Juan, St. Croix and the naval station at Roosevelt Roads.

The latest one-hour reading from the instrument that measures particulate matter continuously is 84 ug/m3. The 24-hour health standard is 150, the annual is 50. This reading is in the air quality index category of moderate - no health message.

more to come

bob
x 3709

Michael Lowy
07/31/01 09:44 AM

To: Evelyn Washington/DC/USEPA/US@EPA
cc: Walter Andrews/R2/USEPA/US@EPA, Bruce Kiselica/R2/USEPA/US@EPA, Robert Poon/R2/USEPA/US@EPA, Bruce Lin/R2/USEPA/US@EPA
Subject: Re: volcanic ash in VI

Evelyn:

In response to your phone call asking about the VI, below is an article DWS came across relating to the situation in the VI. As of this morning, we contacted VI DPNR, and the only measure in effect is a boil water advisory. It is my understanding that the potential of microbial attachment to the ash generated the boil water advisory. The ash would increase the turbidity of whatever cisterns may be affected, thereby decreasing the effectiveness of chlorination, thus the boil water advisory.

I was also in contact with the Puerto Rico DOH this morning. They reported no effects on DW supplies in PR at this time.

Michael Lowy
Environmental Scientist
Drinking Water Section - Water Programs Branch
Region 2 - U.S. EPA
Phone: (212) 637-3830
FAX: (212) 637-3887

----- Forwarded by Michael Lowy/R2/USEPA/US on 07/31/01 09:36 AM -----

Bruce Lin
07/31/01 09:18 AM

To: Walter Andrews/R2/USEPA/US@EPA
cc: Bruce Kiselica/R2/USEPA/US@EPA, Douglas McKenna/R2/USEPA/US@EPA, Gerard McKenna/R2/USEPA/US@EPA, Michael Lowy/R2/USEPA/US@EPA
Subject: Re: volcanic ash in VI

The advisory recommended that users of cistern water boil it for 3 to 5 minutes before using it for drinking or cooking purposes.

OnePaper
St. Croix Source
Copyright

'ASHFALL' ISN'T TOXIC BUT CAN CAUSE PROBLEMS"
by Jean Etsinger and Molly Morris

July 30, 2001 - Scientists call it "ashfall" -- like rainfall, or, in less temperate climes, snowfall. It started silently settling on the Virgin Islands and eastern Puerto Rico Sunday night, catching everyone by surprise when the sun came up.

The fresh volcanic ash that residents found coating their immediate worlds Monday is unsightly, abrasive and a hassle to clean up, but it's not toxic. However, breathing it in may cause trouble for young children, the elderly and anyone with chronic respiratory ailments.

That's the expert information to be found in a web site section titled

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E-Mail: Andrews.Walter@epamail.epa.gov
----- Forwarded by Walter Andrews/R2/USEPA/US on 07/30/01 02:06 PM -----

Bob Kelly
07/30/01 12:37 PM

To: George Pavlou/R2/USEPA/US@EPA
cc: Bruce Kiselica/R2/USEPA/US@EPA, Douglas McKenna/R2/USEPA/US@EPA, John Kushwara/R2/USEPA/US@EPA, Kevin Bricke/R2/USEPA/US@EPA, LisaP Jackson/R2/USEPA/US@EPA, Patrick Durack/R2/USEPA/US@EPA, Raymond Werner/R2/USEPA/US@EPA, Ron Borsellino/R2/USEPA/US@EPA, Walter Andrews/R2/USEPA/US@EPA, Steven Riva/R2/USEPA/US@EPA
Subject: Re: Montserrat Eruption

George,

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more to come

bob
x 3709